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09/577,340	05/24/2000	Hiroaki Takebe	826.1605/JDH	5834
21171	7590	08/25/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			LU, TOM Y	
			ART UNIT	PAPER NUMBER
			2621	15

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

## Office Action Summary

Application No.

09/577,340

Applicant(s)

TAKEBE ET AL.

Examiner

Tom Y Lu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9, 10, 22 and 23 is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-17, 19-21 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 25-26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Request for Continued Examination filed on May 27, 2004 has been entered.
2. Upon entry of Request for Continued Examination, the amendment filed on April 29, 2004 has been entered.
3. Claim 18 was withdrawn from consideration.
4. Claims 1, 5, 9, 11, 15, 16, 17, 19, 20, 21 and 24 are amended.
5. Claims 25 and 26 are newly added.
6. Claims 1-17 and 19-26 are pending.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 5-8, 16, 21, 25 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- a. With regard to Claim 5, the limitation of “the first and the last elements of the feature amount set as an element sequence of a category in the array direction are *independently moved* in the character string array direction...” is not defined in the specification. The closest explanation in the specification, page 10, lines 20-

23, is “the last and the first portions of the array of the feature amount of the category are independently scanned in the array direction...” Nowhere in the specification, the applicant discloses “the first and the last elements of the feature amount set as an element sequence of a category in the array direction are *independently moved*”.

- b. Claims 6-8 are rejected for being dependent upon Claim 5.
- c. Claim 16 is rejected for the same reason given in Claim 5.
- d. Claim 21 is rejected for the same reason given in Claim 5.
- e. With regard to Claim 25, the limitation of “a number of pixels character feature size” is not defined in the specification.
- f. With regard to Claim 26, the limitation of “a character feature physical size” is not defined in the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The examiner does not understand the limitation of “a number of pixels character feature size”. Explanation is required.

#### ***Claim Objections***

9. Claims 25 and 26 are objected to because of the following informalities: misspelling of “character” in line 7 and 8, respectively. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 11-14, 16-17, 19-21 and 24-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamitani et al (U.S. Patent No. 6,327,385 B1).

- a. Referring to Claim 1, Kamitani discloses feature amount extraction unit extracting a feature amount of an image (Kamitani at column 2, lines 7-9, discloses a partial pattern detecting unit 121 as shown in figure 1 for extracting areas coincident with the partial patterns from the image of the character string. A partial pattern detecting unit 121 corresponds to the claimed “feature amount extraction means”. The areas, which is consisted of pixels as shown in figure 5, coincident with the partial patterns corresponds the claimed “feature amount”); feature amount setting unit setting feature amount of a category (Feature extraction inhibited area dictionary 132 shown in figure 1 corresponds to the claimed feature amount setting means); feature amount comparison unit comparing the feature amount of the category with the feature amount of the image (detecting unit 121 is the claimed “comparison means”, see explanation in Paragraph 5 above); and segmentation unit segmenting a portion corresponding to the feature amount of the category from the image based on the comparison result (Character boundary portion detecting unit 134 in figure 1 corresponds to the claimed “segmentation

means”, column 2, lines 23-25); wherein a pattern corresponding to a feature amount of a category at a location of an image is segmented, images are segmented at a position between said images when a touching position between said images does not correspond to a minimum point of a black pixel projection histogram and when an image has a number of uneven portions in a pattern to be segmented, one pattern can prevented from being divided into a large number of areas at the minimum point of the pattern, by collectively segmenting a portion corresponding to a feature amount of a category from an image (Kamitani teaches the separation point of the character string image is determined based on the pattern matching as shown in figure 6, not based on a black pixel projection. For example, as shown in figures 7a and 7b, the separation pointing is 3 on the right based on the partial pattern matching in figure 6. If the separation point is determined according to a black pixel projection histogram, the separation point would have been 7 on the left because it is the minimum point of the pattern as shown in figure 5).

- b. Referring to Claim 2, Kamitani discloses wherein said feature amount comparison unit comprises a correspondence generation unit generating correspondence relationship between the feature amount of the category and the feature amount of the image, and compares the feature amount of the category with the feature amount of the image (Kamitani at column 5, lines 15-24, discloses calculating the degree of coincidence between the partial pattern and the image of character string).

- c. Referring to Claim 3, Kamitani discloses a difference level computation unit computing a difference in level between the feature amount of the category and the feature amount of the image, which are related by the correspondence relationship (column 5, lines 15-24); and an optimum correspondence extraction unit extracting optimum correspondence relationships each of which indicating a lowest difference level from the correspondence relationships, wherein said segmentation unit segments an ear corresponding to positions in which the difference level of the optimum correspondence relationship is equal to or lower than a predetermined value from the image (Kamitani at column 6, lines 50-54, discloses when the degree of coincidence is larger or equal to a predetermined threshold, the character has serif. In addition, Kamitani at column 7, lines 28-30, discloses when the font of characters constituting the string is determined as one having serif, the masking is performed for the objective picture prior to the procedures for obtaining the character separating feature).
- d. Referring to Claim 4, Kamitani discloses a combination unit generating a combination of segmentation areas that are segmented from the image in such a way that areas similar to a feature amount of any categories may be adjacently connected to each other on the image; and a segmentation area determination unit determining a segmentation area of the image by prioritizing a combination in which a value obtained by accumulating each difference level for the corresponding category in each segmentation area of the combination of segmentation area is the smaller of the combinations (Kamitani teaches partial

pattern detector unit 121 calculates the degree of coincidence for each of the characters in the image of character string by overlapping the partial patterns from partial pattern dictionary 122 over the image of character string. Therefore, it is inherently true that the dictionary recognizes all the segmented characters).

- e. Referring to Claim 5, Kamitani discloses a feature amount extraction unit extracting a feature amount of a character string image as a sequence of elements in a character string array direction (Kamitani at column 5, lines 7-8, discloses the image of a character string stored in the image storing unit 110 is read into the partial pattern detecting unit 121 as shown in figure 1. In addition, Kamitani at column 2, lines 7-9, discloses a partial pattern detecting unit 121 as shown in figure 1 for extracting areas coincident with the partial patterns from the image of the character string. A partial pattern detecting unit 121 corresponds to the claimed "feature amount extraction means". The areas coincident with the partial patterns corresponds the claimed "feature amount". The elements are the pixels as shown in figure 5. Moreover, Kamitani at column 5, line 21, discloses the direction is from left to right. Note the elements in Kamitani are pixels as shown in figures 4 and 5. And, a feature amount of a character string image in Kamitani is an area of pixels); a feature amount setting unit setting a feature amount of a category as a sequence of elements in a category array direction (Kamitani at column 5, lines 10 discloses partial pattern stored in the partial pattern dictionary is read in the partial pattern detecting unit 121. the partial pattern detecting unit 121 corresponds to the claimed "feature amount setting unit". In addition, at



column 6, lines 30-31, Kamitani teaches the direction is from left to right as well since the reference coordinates start from (1,8) to (8,8) to (13,8)); a correspondence unit corresponding a last element in the sequence of the elements of the category with each element of the character string image (the reference point as shown in figure 4 is the claimed last element, which is corresponding to the pixels points in figure 5. Note the reference point is the first pixel point in figure 4, however, it can also be defined as the last point); a search unit searching for an element of the character string image relating to the first element of the sequence of elements of the category in each of the sequence of elements of the image, to which the last of the sequence of the elements of the category is related (column 5, lines 12-24); a difference level computation unit computing a difference level in a feature amount between the character string image and the category, whose sequence of elements are related to each other (Kamitani at column 6, lines 24-33, discloses the degree of coincidence is obtained based on the overlapping process between the partial pattern and the image of character string as described at column 5, lines 12-24. The degree of coincidence corresponds to the claimed "difference level"); and a discrimination unit discriminating a segmentation position of a character from the character string image based on the difference level (Kamitani at column 6, lines 50-54, discloses when the degree of coincidence is larger or equal to a predetermined threshold, the character has serif. In addition, Kamitani at column 7, lines 28-30, discloses when the font of characters constituting the string is determined as one having

serif, the masking is performed for the objective picture prior to the procedures for obtaining the character separating feature); wherein the first and the last elements of the feature amount set as an element sequence of a category in the array direction are independently moved in the character string array direction to allow the feature amount of the category to correspond to the feature amount of the character string image (Kamitani teaches the reference point of figure 4 is used to match the partial pattern figure 4 with figure 5. Note figure 4 contains multiple pixels points, one is defined to be the first element and one is the last element).

- f. Referring to Claim 6, Kamitani discloses wherein said difference level is obtained from an accumulation result of a distance between elements from the first elements to the last element in the sequence of the elements of the category (column 5, lines 15-24, column 6, lines 24-33).
- g. Referring to Claim 7, Kamitani discloses wherein said search unit makes a correspondence relationship of a current element in the correspondence relationship of past elements based on the correspondence relationship indicating the smallest accumulation value of the distance between elements (Column 6, lines 33-37).
- h. Referring to Claim 8, Kamitani discloses an entry unit entering a set of a searched element of the character string image that is related to the first element of the sequence of elements of the category and a corresponding difference level each category to be recognized, for each of the sequence of elements of the image

which is related to the last of the sequence of elements of the category (Column 5, lines 7-8, 21); a search unit searching for a difference level whose value is equal to or smaller than a predetermined value of difference levels specified by an element corresponding to the segmentation position of the character string image (column 6, lines 3-6); an acquisition unit obtaining the element of the character string image corresponding to the difference level searched by search unit from said entry unit; and a computation unit computing a subsequent segmentation position of the character string image based on the element of the character string image obtained by said entry unit (column 6, lines 10-18).

- i. With regard to Claim 11, the only difference between Claim 11 and Claim 1 is Claim 11 calls for additional limitation of “generating an arbitrary correspondence relationship between the feature amount of the category and the feature of the image”, Kamitani teaches the matching between the partial pattern and the character string image is an arbitrary correspondence relationship, and the matching is done by coinciding the partial pattern with every pixel in figure 5, see figure 2 for incrementing steps.
- j. Referring to Claim 12, Kamitani discloses wherein said feature amount of the category is compared with the entire feature amount of the image in a continuous DP method (column 5, lines 15-24).
- k. Referring to Claim 13, Kamitani discloses wherein said feature amount is peripheral features up to an n-th peripheral feature (Kamitani teaches the pixel area shown in figure 5 as claimed “peripheral feature”).

- l. With regard to Claim 14, see explanation in Claim 4.
- m. With regarding to Claim 16, the only difference between Claim 16 and Claim 5 is Claim 16 calls for an additional limitation of “scanning first and last elements in a sequence of elements of the category independently of the sequence of the elements of the character string image to allow the feature amount of the category to correspond to the feature amount of the character string image”, Kamitani teaches the partial pattern dictionary contains plural partial patterns, which are independently scanned in advance, column 3, lines 45-47.
- n. With regarding to Claim 17, the only difference between Claim 17 and Claim 11 is Claim 17 calls for an additional limitation of “determining the category used for the segmentation as a recognition result of the area segmented from the image.” Kamitani at column 5, line 60, teaches the partial patterns are registerable in the dictionary, which implies the dictionary is updated as the new partial patterns become available.
- o. With regarding to Claim 19, the only difference between Claim 19 and Claim 11 is Claim 19 calls for an additional limitation of “a computer-readable storage medium storing a program”, Kamitani teaches that at column 8, lines 11-14.
- p. With regard to Claim 20, see explanation in Claim 1.
- q. With regard to Claim 21, see explanation in Claim 5.
- r. With regard to Claim 24, see explanation in Claim 1.
- s. Referring to Claim 25, Kamitani discloses storing a number of pixels character feature size for features to be extracted from a character string image (column 3,

lines 56-57, Kamitani teaches partial pattern dictionary stores partial patterns of the electronic image of the character string. An example of partial pattern is shown in figure 4, which contains a number of pixels, and the size of 6x5 pixels); scanning the character string image and extracting a number of pixels image feature sizes of features in the character string image (column 4, lines 19-20, Kamitani teaches scanning the character string and convert it to electronic form, and an example of the features of the character string image is shown in figure 5); comparing the number of pixels character feature sizes to the image feature sizes and determining best matches between character feature sizes and image feature sizes (column 4, lines 22-31, Kamitani teaches comparing the partial pattern with the character string, see figure 6 for matches); and segmenting the character string image based on the best matches (column 4, lines 60-65, the separation position is determined based on the matches, and the characters are segmented).

- t. Referring to Claim 26, Kamitani discloses storing a character feature physical size for features to be extracted from a character string image; scanning the character string image and extracting image feature physical sizes of features in the character string image; comparing the character feature physical sizes to the image features physical sizes and determining best matches between character feature physical sizes and image feature physical sizes; and segmenting the character string image based on the best matches (feature the physical size are shown in figures 4 and 5, the physical size for partial pattern is 6x5 pixels, and the

physical size for the feature of character string image is 18x12 pixels. See explanation in Claim 25 for other limitations).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamitani in view of Tanaka et al (U.S. Patent No. 5,684,891).

Referring to Claim 15, Kamitani discloses segmenting a first segmentation area corresponding to a feature amount of a category from an image (the explanation is provided in Claim 1). However, Kamitani does not teach changing the first segmentation area when a second segmentation area cannot be segmented corresponding to a feature amount of a category from remaining areas of the image. Tanaka at column 22, lines 45-64, teaches block 503 is segmented as shown in figure 22C. However, the block 503 is actually only a part of a Japanese character as shown in figure 22D, which the system could not further segment the next character after block 503 as shown in figure 22C. Therefore, the system is changed the segmentation area for block 503 to 504 to completely segment the entire Japanese character. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to change the first segmentation area because the second segmentation area cannot be segmented. One of ordinary skill in the art would have been motivated to do this because Tanaka at column 22, lines 25-28, discloses "if the preceding computed segmentation exhibits results relatively better than the

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results of the present segmentation, it is judged to execute re-segmentation at the preceding determination” since some characters, such as Japanese and Chinese, are ideographic, and they are ensemble.

*Allowable Subject Matter*

11. Claims 9-10 and 22-23 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

- a. Independent Claim 9 defines a path generation unit generating a path connecting the segmentation position of the character string image with the next segmentation position of the character string image computed by said computation unit; an attribute assignment unit assigning a coordinate of the segmentation position, the difference level searched by said search unit, and the category corresponding to the difference level as attributes of the path; a combination generation unit generating a combination of the paths by trading the character string image through the path; an evaluation unit evaluating the combination of the paths based on an accumulation result of a difference level assigned to the path; a selection unit selecting a combination of the paths based on the evaluation result; and a selection point determination unit determining a coordinate assigned to a path selected by said selection unit as a selection point of the character string image. These features in combination with other features in Claim 9, which is the broadest allowable claim, are not taught or suggested by the art of record.
- b. Claim 10 is dependent upon Claim 9.

- c. Independent Claim 22 defines features of a path generation unit generating a path connecting the segmentation position of the character string image with the next segmentation position of the character string image computed by said computation unit; a combination generation unit generating a combination of the paths by trading the character string image through the path; an evaluation unit evaluating the combination of the paths based on an accumulation result of a difference level assigned to the path. These features in combination with other features in Claim 22, which is the broadest allowable claim, are not taught or suggested by the art of record.
- d. Claim 23 is dependent upon Claim 22.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y Lu whose telephone number is (703) 306-4057. The examiner can normally be reached on 8:30AM-5PM.

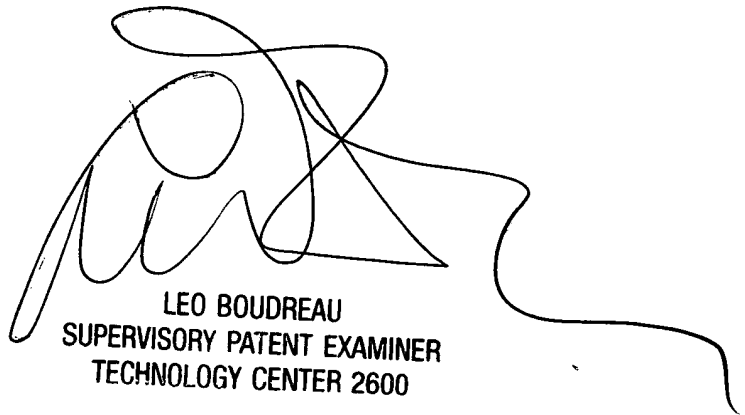
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Y. Lu



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